

Appendix A

Normal Year Weekly Evaporation and
Evapotranspiration for Several Crops in
Southern San Joaquin Valley

Weekly Observed Evaporation and Calculated
Evapotranspiration for Several Crops
Southern San Joaquin Valley
1992 – 1996

TABLE A-1

NORMAL YEAR WEEKLY EVAPORATION AND EVAPOTRANSPIRATION
FOR SEVERAL CROPS IN SOUTHERN SAN JOAQUIN VALLEY¹
(inches)

Week Ending	Day of Year	Evapo-ration ²	ETP ³	PET ⁴	Alfalfa (Hay)	Cotton	Citrus	Deciduous Orchard		Dry Beans	Small Grains	Vineyard
								Clean Cultivation	With Cover Crop			
	Jan 7	0.24	0.22	0.17	0.18		0.14	0.17			0.07	
	14	0.27	0.25	0.19	0.21		0.16	0.19			0.10	
	21	0.30	0.28	0.22	0.23		0.18	0.22			0.13	
	28	0.36	0.33	0.26	0.27		0.22	0.26			0.19	
Feb 4	35	0.42	0.39	0.31	0.32		0.25	0.31			0.26	
	11	0.48	0.44	0.36	0.36		0.28	0.36			0.34	
	18	0.56	0.52	0.42	0.43		0.33	0.42			0.44	
	25	0.64	0.59	0.48	0.49		0.37	0.48			0.54	
Mar 4	63	0.73	0.67	0.55	0.55		0.42	0.56			0.65	
	11	0.82	0.75	0.62	0.62		0.47	0.34	0.64		0.77	
	18	0.91	0.84	0.70	0.69		0.51	0.40	0.73		0.87	
	25	0.84	1.02	0.94	0.79	0.78		0.57	0.47	0.83		1.00
Apr 1	91	1.12	1.03	0.86	0.85		0.63	0.55	0.93		1.10	
	8	1.22	1.12	0.94	0.93		0.68	0.62	1.02		1.18	
	15	1.05	1.33	1.22	1.04	1.01		0.74	0.70	1.14		1.26
	22	1.12	1.44	1.32	1.12	1.09	0.13	0.81	0.81	1.25	0.02	1.35
	29	1.19	1.55	1.43	1.21	1.18	0.16	0.87	0.90	1.30	0.03	1.43
May 6	126	1.65	1.54	1.30	1.27	0.22	0.94	1.00	1.50	0.06	1.45	0.22
	13	1.79	1.65	1.40	1.36	0.29	1.00	1.13	1.63	0.16	1.40	0.32
	20	1.40	1.90	1.75	1.48	1.44	0.38	1.06	1.24	1.75	0.36	1.27
	27	1.47	2.00	1.84	1.56	1.52	0.48	1.10	1.34	1.86	0.47	1.08
Jun 3	154	2.09	1.92	1.63	1.59	0.69	1.13	1.42	1.94	0.71	0.86	0.96
	10	1.61	2.18	2.01	1.70	1.66	1.00	1.16	1.50	2.05	1.32	1.09
	17	1.68	2.25	2.07	1.76	1.71	1.33	1.17	1.60	2.12	1.83	1.22
	24	1.75	2.30	2.12	1.79	1.75	1.63	1.20	1.68	2.16	1.91	1.31
Jul 1	182	2.32	2.13	1.81	1.76	1.90	1.21	1.72	2.18	2.04		1.39
	8	1.89	2.32	2.13	1.81	1.76	2.18	1.21	1.74	2.18	2.05	
	15	1.96	2.30	2.12	1.79	1.75	2.25	1.20	1.72	2.18	1.93	
	22	2.03	2.25	2.07	1.76	1.71	2.25	1.17	1.69	2.14	2.00	
	29	2.10	2.20	2.02	1.72	1.67	2.20	1.14	1.65	2.07	1.80	
Aug 5	217	2.11	1.94	1.65	1.60	2.11	1.10	1.58	1.98	1.52		1.39
	12	2.24	2.02	1.86	1.58	1.54	2.02	1.05	1.52	1.90	1.18	
	19	2.31	1.92	1.77	1.50	1.46	1.90	1.00	1.44	1.79	0.85	
	26	2.38	1.83	1.68	1.43	1.39	1.78	0.95	1.37	1.68	0.44	
Sep 2	245	1.74	1.60	1.36	1.32	1.60	0.90	1.30	1.58	0.07		1.15
	9	2.52	1.64	1.51	1.28	1.25	1.39	0.85	1.21	1.48	0.07	
	16	2.59	1.53	1.41	1.19	1.16	1.16	0.80	1.10	1.36		0.98
	23	2.66	1.41	1.30	1.09	1.07	0.92	0.73	0.99	1.24		0.86
	30	2.73	1.29	1.19	0.99	0.98	0.71	0.68	0.86	1.11		0.68
Oct 7	280	1.17	1.08	0.90	0.89	0.53	0.64	0.76	0.98			0.57
	14	287	1.05	0.97	0.80	0.80	0.38	0.59	0.65	0.87		0.44
	21	294	0.93	0.86	0.70	0.71		0.52	0.55	0.74		0.33
	28	301	0.82	0.75	0.62	0.62		0.46	0.46	0.66		0.25
Nov 4	308	0.71	0.65	0.53	0.54		0.40	0.37	0.55			0.14
	11	315	0.60	0.55	0.44	0.46		0.34	0.28	0.46		
	8	322	0.50	0.46	0.36	0.38		0.28	0.22	0.37		
	25	329	0.41	0.38	0.30	0.31		0.23	0.16	0.30		
Dec 2	336	0.32	0.29	0.23	0.24		0.18					
	9	343	0.25	0.23	0.18	0.19		0.14				
	16	350	0.21	0.19	0.15	0.16		0.12				
	23	357	0.19	0.17	0.13	0.14		0.11				
	30	364	0.22	0.20	0.15	0.17		0.13				
31 ⁵	365	<u>0.03</u>	<u>0.03</u>	<u>0.02</u>	<u>0.02</u>		<u>0.02</u>	<u>0.02</u>			<u>0.01</u>	
Total ⁶		63.86	58.78	49.33	48.54	31.59	34.54	39.04	56.48	20.82	17.88	26.11

¹Crop ET estimated by multiplying weekly evaporation (Ep) for normal year by crop coefficients (Kp).²Evaporation from USWB Class 'A' pans located in large irrigated pastures. Average of several locations and several years.³Potential ET - alfalfa; ET of vigorously growing alfalfa at 100-percent ground cover and no moisture stress (Jensen-Haise alfalfa reference crop).⁴Estimated as 0.92 x pan evaporation.⁵Potential ET - grass; ET of low-growing grass at 100-percent ground cover with no moisture stress (Penman grass reference crop).⁶ET for one day.⁷Growing season totals.

TABLE A-2

WEEKLY OBSERVED EVAPORATION AND CALCULATED
EVAPOTRANSPIRATION FOR SEVERAL CROPS

SOUTHERN SAN JOAQUIN VALLEY

1992
(inches)

Week Ending	Day of Year	Evapo-ration ⁱ	ETP ⁱⁱ	PET ⁱⁱⁱ	PET (inches/day)	Alfalfa Hay	Cotton	Citrus	Deciduous Orchard		Dry Beans	Small Grains	Vineyard
									Clean Cultivation	With Cover Crop			
Jan 2	2	0.04 ^{iv}	0.04	0.03	0.015	0.03		0.02		0.03		0.01	
9	9	0.36	0.33	0.25	0.036	0.27		0.21		0.25		0.11	
16	16	0.14	0.13	0.10	0.014	0.11		0.08		0.10		0.05	
23	23	0.14	0.13	0.10	0.014	0.11		0.08		0.10		0.06	
30	30	0.20	0.19	0.15	0.021	0.16		0.12		0.15		0.11	
Feb 6	37	0.48	0.44	0.36	0.051	0.37		0.29		0.36		0.30	
13	44	0.57	0.52	0.42	0.060	0.43		0.34		0.43		0.40	
20	51	0.58	0.53	0.44	0.062	0.44		0.34		0.44		0.45	
27	58	0.60	0.55	0.45	0.065	0.45		0.35		0.45		0.50	
Mar 5	65	0.76	0.70	0.58	0.082	0.58		0.44		0.58		0.68	
12	72	0.68	0.63	0.52	0.074	0.52		0.39	0.28	0.53		0.64	
19	79	0.82	0.76	0.63	0.090	0.62		0.46	0.36	0.66		0.79	
26	86	0.81	0.74	0.62	0.089	0.62		0.45	0.37	0.66		0.79	0.08
Apr 2	93	0.89	0.82	0.69	0.098	0.68		0.50	0.44	0.74		0.87	0.10
9	100	1.21	1.11	0.93	0.133	0.92		0.68	0.62	1.02		1.17	0.16
16	107	1.35	1.24	1.05	0.150	1.02	0.12	0.75	0.71	1.16		1.28	0.24
23	114	1.77	1.63	1.38	0.197	1.34	0.18	0.99	0.99	1.54		1.66	0.57
30	121	1.74	1.60	1.36	0.194	1.32	0.19	0.97	1.01	1.55		1.60	0.70
May 7	128	1.81	1.66	1.41	0.201	1.37	0.25	1.01	1.08	1.63		1.57	0.83
14	135	2.02	1.86	1.58	0.225	1.54	0.34	1.13	1.27	1.84	0.22	1.58	1.01
21	142	1.99	1.83	1.55	0.222	1.51	0.42	1.12	1.29	1.83	0.30	1.33	1.08
28	149	2.17	2.00	1.69	0.242	1.65	0.57	1.20	1.46	2.02	0.59	1.02	1.24
Jun 4	156	2.35	2.16	1.83	0.261	1.78	0.80	1.27	1.60	2.18	1.43		1.41
11	163	2.38	2.19	1.85	0.265	1.81	1.12	1.26	1.64	2.23	1.95		1.50
18	170	2.08	1.92	1.62	0.231	1.58	1.21	1.08	1.48	1.96	1.83		1.35
25	177	2.22	2.04	1.73	0.247	1.69	1.55	1.15	1.62	2.08	2.00		1.46
Jul 2	184	2.20	2.02	1.72	0.245	1.67	1.83	1.15	1.63	2.07	1.98		1.45
9	191	1.76	1.62	1.38	0.196	1.37	1.69	0.94	1.35	1.69	1.62		1.19
16	198	1.95	1.79	1.52	0.217	1.48	1.93	1.01	1.46	1.85	1.76		1.29
23	205	2.18	2.00	1.70	0.243	1.66	2.18	1.13	1.64	2.07	1.90		1.44
30	212	2.06	1.90	1.61	0.230	1.57	2.06	1.07	1.55	1.94	1.61		1.36
Aug 6	219	2.14	1.97	1.67	0.239	1.63	2.14	1.11	1.61	2.01	1.33		1.41
13	226	1.98	1.82	1.54	0.221	1.51	1.98	1.03	1.49	1.86	0.87		1.31
20	233	2.06	1.90	1.61	0.230	1.57	2.02	1.07	1.55	1.92	0.52		1.32
27	240	1.91	1.76	1.49	0.213	1.45	1.80	0.99	1.43	1.76			1.17
Sep 3	247	1.64	1.51	1.28	0.183	1.25	1.43	0.85	1.23	1.49			0.87
10	254	1.60	1.47	1.25	0.178	1.22	1.26	0.83	1.18	1.44			0.78
17	261	1.54	1.41	1.20	0.171	1.22	1.11	0.84	1.16	1.43			0.68
24	268	1.65	1.52	1.27	0.182	1.26	0.96	0.86	1.16	1.45			0.60
Oct 1	275	1.51	1.39	1.16	0.166	1.15	0.76	0.79	1.01	1.30			0.45
8	282	1.15	1.05	0.88	0.126	0.87	0.46	0.61	0.74	0.96			0.23
15	289	1.13	1.04	0.86	0.122	0.86		0.62	0.70	0.94			0.23
22	296	0.81	0.74	0.60	0.086	0.61		0.45	0.48	0.65			0.16
29	303	0.79	0.73	0.59	0.085	0.60		0.44	0.44	0.63			0.16
Nov 5	310	0.60	0.55	0.45	0.064	0.46		0.34	0.31	0.46			0.12
12	317	0.56	0.52	0.42	0.059	0.43		0.31	0.26	0.44			
19	324	0.42	0.39	0.31	0.044	0.32		0.24	0.18	0.31			
26	331	0.48	0.44	0.35	0.050	0.36		0.27	0.19	0.35			
Dec 3	338	0.53	0.49	0.38	0.055	0.41		0.30		0.38			
10	345	0.44	0.40	0.31	0.044	0.33		0.25		0.31		0.08	
17	352	0.23	0.21	0.16	0.023	0.17		0.13		0.16		0.05	
24	359	0.19	0.18	0.13	0.019	0.15		0.11		0.13		0.04	
31	366	<u>0.30</u>	<u>0.28</u>	<u>0.21</u>	<u>0.031</u>	<u>0.23</u>		<u>0.18</u>		<u>0.21</u>		<u>0.08</u>	
Total ^v		63.97	58.85	49.37		48.73	30.36	34.60	38.97	56.73	19.91	17.22 ^{vi}	27.95

ⁱObserved evaporation, Class 'A' pan, irrigated pasture. Average of Lamont 2NW and Bakersfield 12S.ⁱⁱPotential ET of alfalfa. ET of vigorously growing alfalfa at 100-percent ground cover with no moisture stress (Jensen-Haise alfalfa reference crop). Estimated as 0.92 x pan evaporation.ⁱⁱⁱPotential ET of grass. ET of large expanse of low-growing grass at 100-percent ground cover with no moisture stress (Penman grass reference crop).^{iv}Two-day period.^vGrowing season total.^{vi}Growing season ET includes 0.25 inch from December 1991 and excludes 0.25 inch from December 1992.